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PILOTS AND OBSERVERS
OF ARTILLERY AND THE AIR SERVICE

INSTRUCTIONS
FOR THE
EMPLOYMENT OF AERIAL OBSERVATION IN LIAISON WITH THE ARTILLERY

TRANSLATED
FROM THE FRENCH EDITION OF JANUARY 19th 1917
AT
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OFFICE OF THE CHIEF OF STAFF.

August 1st 1917

The accompanying free translation of the French official pamphlet entitled « Aerial Observation in liaison with the Artillery » is announced as the official provisional Manual on this subject for the American Expeditionary Forces.

Until modified by proper authority, its provisions will be strictly complied with in all exercises and operations involving the use of the Air Service and the Artillery.

By command of Major General Pershing :

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GENERAL HEADQUARTERS
OF THE ARMIES
OF THE NORTH AND EAST.

GENERAL STAFF.

3rd BUREAU.

January 19, 1917.

INSTRUCTIONS

FOR

THE EMPLOYMENT OF AERIAL OBSERVATION IN LIAISON WITH THE ARTILLERY.

Many targets are hidden from terrestrial observers. For this reason, the aeroplane and the balloon are indispensable auxiliaries to the artillery.

The present instructions rescind and replace previous instructions on the same subject. They are intended to furnish information covering :

I. The conditions under which aerial observation is used with artillery ;

II. The missions which may be fulfilled ;

III. The duties of the personnel concerned.

Annex I establishes rules for the observation and conduct of fire by aeroplanes and balloons with a note on the designation of objectives.

Annex II gives codes for the transmission of signals.

PART I.

CONDITIONS GOVERNING THE EMPLOYMENT OF AERIAL OBSERVATION IN LIAISON WITH ARTILLERY.

1. Under good atmospheric conditions, the aeroplane can give rapid, accurate and, if necessary, vertical observation even on the most distant targets. It makes it possible to observe not only the sense of salvos, but also the *amount* of the observed error.

2. The aeroplane signals to the ground by means of wireless telegraphy, by projectors, by dropped written messages; or by signal lights. Wireless telegraphy is the best method. A conventional code, Morse system, permits the observer to report his presence to designate targets, to report results of fire, and to give all required information to friendly troops concerning the movements of the enemy. This information is received at the receiving stations described in paragraph 8 and 11.

3. The receiving stations can, by means of panels of white cloth or projectors, give the aeroplane a limited number of simple indications concerning the conduct of fire. There are in addition a few receiving sets on aeroplanes which can be used with transmitting sets at receiving stations near important headquarters.

4. Use of Wireless Telegraphy : The use of wireless telegraphy has given a tremendous importance to aerial liaison with artillery. On account of its delicate nature, and the great number of aeroplanes which necessarily have to work in a restricted zone, strict discipline and careful organization are necessary to reduce to a minimum the many chances for confusion.

Different aeroplanes are distinguished as follows :

a. By the «call» adopted for each receiving station.

b. By the use of varying wave-lengths.

c. By varying the loudness of the emission.

d. By the use, in certain cases, of watches with colored dials which make it possible for neighboring aeroplanes to send their signals at alternate specified intervals and thus avoid confusing their signals. This device interferes with the continuity of observation and should be used only when necessary.

It is important that aeroplanes keep out of neighboring zones, and that they do not come closer than two kilometers to their own receiving stations except for very important messages. Messages sent when immediately above the antennae interfere seriously with other messages.

Technical matters concerning Wireless Telegraphy are prescribed in each Army, and in each Army Corps by the Chief of the Radio Service concerned.

In each Army Corps designated officers of air-squadrons supervise the Wireless Telegraph Service in their own squadrons and at the receiving stations. These officers are under the orders of their squadron commanders and of the Chief of the Radio Service of the Army or Army Corps.

5. Projectors : By means of projectors communication can be established :

a. When the artillery has no receiving station.

b. When there are many aeroplanes working in one zone and interference amongst wireless messages is unavoidable.

c. When the distance is not too great.

d. Projectors of neighboring aeroplanes can be distinguished :

1. By the orientations of sheafs of light, or
2. By the use of a pre-arranged call.

6. Dropped Written Messages : Dropped written messages may be used to give information concerning targets or the results of fire. Each message is placed in a small container provided with a streamer. They should be dropped from a height not more than 300 meters and as close to the receiving station as possible.

7. Use of Signal Lights : In principle, signal lights are used only for communication with the infantry. During the artillery preparation, their use with the artillery may be authorized by proper authority. A conventional code must be adopted at a preliminary conference, and only a few simple messages can be sent.

8. Receiving Stations : Each Artillery Command, Sub-Command, or Group (in certain cases, each Battery) is equipped with a receiving station. A specially trained officer called the Receiving Officer (*officier d'antenne*) is provided at each receiving station. He transmits by voice or telephone to the unit concerned the interpretation of the information received from the aeroplane. It is an important and delicate duty requiring great specialization.

Each receiving station must have direct permanent telephone connection with each battery. In each artillery command there must be provision for the use of auxiliary receiving stations when the antennae at the main receiving stations are broken.

9. Telephones : Connections are provided as required by the Instructions on liaison.

10. Panels : Each receiving station is provided with identification panels which enable aeroplanes to distinguish their own receiving stations. They are especially necessary when the artillery changes position.

In addition to the identification panels, window-shutter panels (*panneaux à persiennes*) are provided for use with the Morse code.

All panels are transported by the artillery units to which they are issued.

11. Receiving Stations : The use of receiving stations varies with the tactical situation as follows :

a. The receiving station of a group or battery acts as a station for the adjustment of the fire of its own unit. (Note : A «group» corresponds to a field artillery battalion in the U. S. Service.)

b. The receiving station of an artillery sub-command acts as a post of commandment. The aeroplane asks such stations for authority to adjust on targets which appear in the zone and receives from such stations the orders of the artillery commander. In the case of special groups or batteries which have been given particular missions, the aeroplane consults the group or battery direct without the intervention of the artillery commander.

c. The receiving station of a command acts as fire control station. It follows the work of the aeroplanes of the Artillery Command as well as that of the infantry aeroplanes operating in the same zone in order to gather all important useful information.

d. **Supervising Receiving Stations** of each Army Corps are placed near the Corps Headquarters or else at Artillery Headquarters. They should, in general, receive messages from all the aeroplanes of the Army Corps or at least from all those having a general mission, such as supervising the artillery, accompanying the infantry or operating with the higher command. In this way, they receive and distribute all information sent in by the aeroplanes.

Whenever it is evident that calls from aeroplanes are being disregarded or not being heard, supervising receiving stations will notify subordinate receiving stations.

e. **Receiving Stations at Air-Squadrons** : Each air-squadron has a receiving station by which the emissions of aeroplanes may be verified at the moment of departure, the work of the aeroplanes at the front followed, and relief of aeroplanes requiring it may be furnished.

12. The Artillery Commander, after conference with the Air Commander and the Chief of the Radio Service of the Army Corps or the Army, fixes the conditions governing the work of the personnel at receiving stations.

At certain times, particularly during an action or in a war of movement, the Artillery Commander will provide for uninterrupted listening service at receiving stations in order that all aeroplanes calling the Artillery Command or Sub-Command may he put in communication at once. The complete liaison is the duty of the Receiving Officer (*officier d'antenne*). He should study it with care and be held responsible for the proper working of all means of communication (telephone, optical telegraph, wireless telegraph, messengers, etc.).

13. The signal codes for wireless telegraphy, for projectors, for identification panels and a model for dropped written messages will be found in Annex II.

BALLOONS.

14. Balloons usually observe at from 1,000 to 1,500 meters, never above 2,000. These altitudes must be reduced in strong winds. Balloons with two baskets can carry two observers with separate telephone connection.

15. On account of its vulnerability, the balloon must keep at a long distance from the enemy, not less than 9,000 to 10,000 meters when ascents, descents, etc., have to be made. Once in the air, it can be carried on the winch to within 6,000 or 7,000 meters.

16. There are always portions of the terrain hidden from the balloon observer. Such dead spaces will be marked on the map and furnished to the Artillery Commands.

17. On account of the delay involved in changing observers, during action an observer must remain up all day.

18. The telephone is depended upon for communications.

The necessary lines are shown in the Instructions on liaison.

In addition, each Balloon Company is furnished with a wireless telegraph sending set with which information received from the balloon may be sent to the Higher Command and the Artillery Groups in cases in which the telephone connection is interrupted.

19. Mobility : When the way is not blocked by trees, wires, etc., balloons can be easily moved without deflatation or even when in the air.

PART II.

ARTILLERY MISSIONS WHICH AERIAL OBSERVATION CAN ASSIST.

20. Such missions are :

Artillery Information covering enemy works in a sector;

Observation of enemy activity in a sector ;

Liaison with other Arms ;

Observation and Adjustment of artillery fire.

21. Artillery Information Service : This consists in obtaining all possible information concerning enemy works so that the following targets may be located :

Posts of Command, machine-gun emplacements, battery positions, communication trenches, etc.

Photographs, *interpreted by specialists,* are superior to information furnished by the observer himself. After details have been located in photographs, however, a second personal reconnaissance, made with high-powered field-glasses, will often be of value.

22. All aerial information gained by an air squadron is consolidated by the Information Officer of the Squadron who communicates it at once to the Artillery Information Officer (S. R. A. — Service Renseignements d'Artillerie). In a similar manner, the Artillery Information Officer of a Command transmits all his information to the Air Service.

Targets are identified by giving their co-ordinates. Each enemy battery thus identified should be described on its own information card. (See Appendix I.)

From photographs, the rough sketches by the Air Service, the Corps Provisional Interpretations, and the Firing Maps are made up.

The rapid transmission of these sketches, especially during an action, is of the greatest importance.

23. The Observation Service consists in watching a given sector for the purpose of giving immediate information in regard to active batteries in order that friendly troops in danger may be warned, and eventually the action of friendly troops be observed.

24. Such service is particularly hard on aeroplane observers for, on account of the noise of their own motors, they can hear nothing and must watch uninterruptedly. For this reason, aeroplane observation is carried on only over terrain hidden from the balloons or during action.

25. Except in cases of zones defiladed from balloons and for special missions, aeroplanes will not be used for continual observation except when no balloons are available.

26. The service of continual watchfulness should be developed. It is the duty of the aerial observer to call for immediate fire whenever he may judge it necessary. It is the duty of the Commanding Officer to see that troops co-operate with aerial observers. If possible, receiving stations will notify aerial observers as to which battery is going to fire.

27. Liaison with Infantry or Cavalry : This is covered by Instructions on liaison.

28. Observation of Fire : This service includes the following :

Fire for adjustment or verification, in order to register the terrain and prepare for fire for effect ;

Fire at a single range and fire of precision for the purpose of neutralizing or destroying the enemy's works ;

Systematic fire opened by shifting a previously established sheaf of fire in order to neutralize momentarily targets upon which fire of precision cannot be undertaken.

29. The sense and amount of errors in firing can be given only if each salvo or rafale is fired at the demand of the aerial observer. For adjustment of fire and for fire for precision, the aeria lobserver is particularly suitable. He increases the efficiency of fire and saves ammunition. For systematic fire when the aerial observer is not advised before the firing of each salvo or rafale, aerial observation is of less value.

30. Aerial observation is limited to three hours at most and is liable to interruptions due to atmospheric conditions or aerial combats. For this reason, battery commanders should fire as rapidly as their matériel permits without sacrificing accuracy to speed.

The balloon which is useful at short or mid ranges as it communicates easily with the ground is also useful for certain adjusting fire and fire of precision. It is sometimes useful to open fire which the aeroplane finishes, and inversely to observe fire for effect which the aeroplane has commenced.

Rules for the conduct of fire with aerial observers are given in Appendix I.

32. Co-ordination of Service of Balloons and Aeroplanes : This co-ordination is realized as follows :

By a judicious division of duties between aeroplanes and balloons, on the part of the Artillery Commander;

By the close association of the two services, inter-communication by means of documents, plans, photographs, and good telephone service connecting the squadrons and balloons of the same command. This assurance of this association is the duty of the Air Commander of the Army.

33. Division of Duties among Aeroplanes : Whenever an aeroplane can be assigned to each Artillery Command and the artillery preparation has been partially made, each observer should be given a definite task of observation and of fire in his own zone.

In order to avoid errors, observers who have identified targets should ordinarily be required to adjust fire on those same targets when possible.

But, under certain other conditions, it may be advisable in a large zone to assign to one aeroplane the supervision and control of systematic fire and to others the adjustments and the fires of precision.

34. The relative importance of the different missions assigned to aeroplanes varies with circumstances and the various phases of the action. It is indicated by the Commanding General.

35. However, in an offensive action against a fortified position the chief missions to be given to artillery aeroplanes follow one another as follows :

a. Information service and observation service in order to determine precisely the location of enemy batteries and positions.

b. Observation for the registration of the terrain and the adjustment of batteries on the principal targets on which they can fire.

c. Observation of fire for precision for the destruction of enemy batteries and defensive positions.

d. Observation for fire control commencing as early as possible on the day of the attack.

e. During the action, neutralization or destruction of enemy's batteries, dispersion of reserves and reinforcements, and watchfulness over well-defined zones for the observation of fire for effect and for rapid shifts to new targets particularly important. It may even be necessary to assign such targets to special aeroplanes.

36. Periods of Movement : In principle, in periods of movement, each division is given its zone of march and action. This zone is explored by aeroplanes. In accordance with plans made in advance, they communicate the information obtained by aerial signal lamps, by signal lights, or by wireless telegraphy to information centers established successively along the route of the Division according to the orders of the Division Commander in such a way that reception shall be continuous.

Such information centers are in communication with the aviation field by optical telegraph, telephones, wireless telegraphy, pigeons, aeroplanes and automobiles.

At each information center there must be an officer of the Air Service who should at once select a landing ground easy of access, and near the information center. The Commanding General at once details the necessary personnel for the observation and establishes all means of liaison possible.

The Division Commander has the Artillery Commander with him and successively moves his headquarters from one information center to another as the advance continues.

The Artillery Commander makes requests on the Air Service, through the information center, for such aeroplanes as he may require, assigns them to his units and indicates their missions if possible.

Upon leaving the squadron, the aeroplanes fly towards the information center which at once indicates the groups to which they have been attached and the targets concerned. The groups indicate their positions by displaying their panels.

Artillery Division and Group Commanders must establish receiving stations whether they are needed at once or not. For this purpose, the wireless telegraphy tractors are pushed as far forward as possible. Landing grounds should be near information centers. The Divisional Artillery Commander sends the necessary orders to the landing grounds, and when possible retains observers who utilize such aeroplanes as come in to the landing grounds for the carrying out of new missions which may be given them. In no case should lack of landing grounds or telephonic communication interfere with aerial observation. As the fight develops, conditions more and more approach those of stabilized or trench warfare.

PART III.

DUTIES OF PERSONNEL.

37. Efficiency of Aerial Observation in liaison with Artillery depends upon :

a. The efficiency of the pilot and of the observer;

b. The efficiency of the Receiving Officer (*officier d'antenne*);

c. The efficiency of Commanding Officers.

38. Aerial observers must be perfect masters of the map of the zone involved and must know absolutely the position of their own and hostile batteries and the intentions and dispositions of the Commanding Officer. They must frequently consult artillery group and battery commanders. In addition, both the pilot and the observer must appreciate the great importance of their mission and be prepared to carry it out in spite of hostile aeroplanes.

39. The Receiving Officer (*officier d'antenne*) has a position as important as that of the observer. He must be permanently detailed in each command. His duties are to inspect the receiving station and all its equipment and keep it in perfect condition, to interpret and transmit all information received from the aerial observer, to communicate with him by means of panels or other devices, and to classify and record all data useful for his own and neighboring groups. After orders for an adjustment are received, he must co-operate with and assist in every way the aerial observer and the Battery Commander.

40. The Commanding Officer fixes the program and announces his purpose. Based on the information received from the aerial observer, he assigns targets to various groups and batteries. He acts on request for artillery fire and decides whether such fire shall be fire for precision or zone fire. He communicates all useful information to higher authority and keeps in touch with neighboring commands. He keeps in touch with the infantry advance as reported by the aeria observers and takes suitable measures to insure that this advance is not interfered with by fire of the friendly artillery.

41. It is the duty of Battery Commanders to deliver regular, accurate and rapid fire at the instant that it is requested by the aerial observer.

42. Every one concerned should bear in mind :

a. That all messages must be brief, and

b. That the enemy is probably following all emissions of the wireless.

43. Instruction should be so carried on that the air Service already existing on any front may be reenforced by units coming from other parts of the front and so that many balloons and airplanes may work together on a restricted front. To this end :

a. Appendices I and II must be strictly followed ;

b. Aerial observers must work precisely so as to reduce the length of their transmissions;

c. Receiving Officers must put out signals quickly;

d. All must be trained to work together in spite of simultaneous emissions, simultaneous firing of batteries and other characteristics of an intense action. In order to accomplish this, frequent combined exercises must be held.

44. Such exercises include the following :

Ground exercises between aerial observers and Receiving Officers, viz : Practice in communicating with wireless telegraphy, optical telegraphy, with panels and with projectors on the ground. For this purpose sending and receiving instruments must be mounted at air-squadrons so that the work may be carried on in weather too bad for flying. The exercises should include the use several wireless sets.

45. Ground exercises between aerial observers, receiving stations and Battery Commanders, viz : The director of the exercise assumes certain conditions concerning the fall of shots by means of the map and thus tests the quickness of mind of the observer, the wireless and telephone service and the co-operation between the receiving station and the battery.

46. Exercises in flight to test the use of instruments, viz :

the designation of objectives, first with one battery and one aerial observer and then with several.

47. The foregoing exercises should be repeated under the assumed conditions of a war of movement.

PONT,
Major General.

ANNEX I.

PART I.

RULES FOR THE CONDUCT OF FIRE.

AEROPLANES WITH LIGHT ARTILLERY.

1. Aerial observation permits exact reconnaissance of targets, the measurement of errors in deflection and range, the observation of rafales or salvos delivered simultaneously and the measurement of their mean error.

The difficulties include precarious communication, the short time-available for observation, the rapid movement of the aeroplane, snow, wind, rain, clouds, the sun, ground hidden by the wings and the limited action of the wireless telegraph. All of these difficulties render aerial observation at times intermittent.

Success implies a close understanding between the observer and the battery commander, the use of simple means of communication, and the *avoidance of all dialogue.* Great latitude should be allowed the aerial observer in making requests, decisions, etc. The battery commander should avoid loss of time by being able to adjust quickly once he has received the proper information.

CONDUCT OF FIRE.

2. In service firing there should always be a preliminary conference between the observer and the battery commanders, but for practice this conference should frequently be omitted.

Before passing to aerial conduct of fire, it is the duty of the battery commander :

a. To adjust the sheaf;

b. In time-fire, to adjust the height of burst just above the ground ;

c. To adjust all his guns for range on an auxiliary target visible for terrestrial observers;

d. To establish a direct line of communication to the receiving station, avoiding all relays.

Assuming that this has been done the aerial observer, after reaching the required height sends his call and signals as follows :

Observer : *Is the Battery ready?*

Receiving station : *The Battery is ready.*

3. Adjustment of Fire : It is assumed that, unless otherwise agreed upon or requested, all firing shall be by battery salvos adjusted for parallel fire. To vary the distribution, the observer sends for example :

Front n *meters. — Sheaf is too wide.*

For registration on a narrow target, the observer sends, for example :

Concentrate. — Fire otherwise good.

4. Battery salvos are fired with all guns at the same range and as nearly simultaneously as possible.

5. In principle, the same ammunition which is to be used in fire for effect should be used in fire for adjustment; but, in principle, it is desirable to use time-shrapnel for preliminary adjustment of the deflection on account of its greater visibility. If the height of burst must be changed to avoid a cover, it must be changed with the angle of site and not with the corrector in order to keep all bursts in the same vertical plane.

6. Fire should be always delivered when the aerial observer asks for it. If there is to be a delay of more than thirty seconds, do not fire but wait for another request from the observer. Interruptions of a serious nature are signalled by one of the following messages :

Wait several minutes, or

Battery not ready. — There will be a delay of more than ten minutes.

No further need of you.

7. It is essential that the preliminary adjustment be as accurate as possible. Frequent correction of the deflection, etc., wastes too much valuable time. If the observer, when in a position to observe, sends :

Lost,

do not fire again with the same data, but use data half way between that of the last salvo seen by the aerial observer and the salvo which he has been unable to see. But, on the contrary, if the observer sends :

Was not in a position to observe,

the previous data should be repeated.

8. Errors in range are reported by taking the average error of the four shots of the salvo with reference to the target. Errors in deflection are reported by taking the interval between the right of the sheaf and the right of the target. Before obtaining proper bracketing, the battery must make corrections as required by reported errors. In difficult country where bursts are hard to observe, the aerial observer should ask for rather conservative corrections.

9. To correct a sheaf badly distributed, the aerial observer may send, for example :

No. 1. — Fire.

The first gun then fires two rounds rapidly. By causing the first and fourth guns to fire, the front of the sheaf may be ascertained.

10. To shift the sheaf to a new target, or to a new part of an old target, the aerial observer should send, for example :

Change Target. — Add 200.

11. Fire for Effect : This may be either fire for precision at a single range, each volley or salvo being observed by the aerial observer and the adjustment being constantly refined, or it may be zone fire.

12. When firing at a single range, battery volleys of two or four rounds each are usually employed. Each volley is fired at the request of the aerial observer who reports the mean error of each. Concentrated fire is very easily observed and is useful for this reason.

13. Fire for Precision by single Piece : The aerial observer may send, for example :

No. 1. — Fire for Precision. — Fire.

No. 1. then fires four *rounds* at full speed, and the aerial observer reports the mean error of the group of bursts.

14. Zone Fire : This may be either :

a. After the aerial observer has completed adjustment and observed the delivery of more or less prolonged fire for effect. In an action, this observation is usually restricted to the observation of the limits of a 100-yard bracket. For this, the aerial observer demands, for example : *Zone fire,* or

b. Progressive Fire, which is usually delivered after adjustment on a target or an auxiliary target, without verification.

Only the general effect can be reported. The zone to be covered should usually not exceed 100 meters.

RULES OF OBSERVATION.

15. If the position of the battery is known, refer bursts to the line B-T (Battery-Target), and give the errors, for example

055 meters right. — 202 meters short.

Only after obtaining a bracket, the observer may send only the *sense* of the bursts always starting with the deflection.

In order to estimate the amount of errors, the aerial observer refers the distance between known points on the map to the front of a salvo, or makes calculations based on the width of his wings or mountings. The displacements of the points of fall of the projectile in response to his corrections help the aerial observer to perfect his scale of distances. Aerial photographs of the same country taken at the same height are also very useful gauges for the estimation of distances. Corrections in range are given in even multiples of 100 and 50 meters; corrections in deflection are given in units of 25 meters.

16. If the battery position is not accurately known, refer the bursts to a North and South line and an East and West line passing through the target, for example :

101 East. — 055 North.

17. When using time shrapnel, aerial observation indicates errors in deflection only.

18. To get on a target rapidly which has not been previously designated on the map, the aerial observer sends, for example :

Lay on me. — Range 4000.

The aerial observer then flies directly on the lines $B - T$.

19. In the designation of objectives, the aerial observer is the representative of the Commanding Officer. In order to identify targets their co-ordinates are announced. (See Annex I, Part 3, or Tables of Signals No. 4, Annex II.)

In firing, the aerial observer is simply the collaborator of the battery commander. The responsibility for the fire rests with the battery commander; and the aerial observer intervenes only under the following conditions :

a. If conditions require time-fire or volley fire of several rounds. He then requests :

Time Fire. — Battery volley.

b. If conditions require fire for precision. He then requests :

Fire for precision. — Is the Battery ready?

c. If the result desired is attained. In this case, he sends, for example :

Result attained. — Cease firing.

d. If a change of target is necessary. He then requests, for example :

Change Target. — Subtract 200.

e. If further observation is impossible. In this case, he sends :

Further observation impossible. I am going to land.

PART II.

BALLOON OBSERVATION WITH LIGHT ARTILLERY.

RULES OF FIRE.

1. The conditions which govern observation of light artillery fire with aeroplanes do not apply entirely in the case of balloons, on account of the superiority which the telephone gives from the point of view of communication. The following modifications should be noted :

a. With the 75^{mm} gun, time shrapnel should be used to give rough indications of the direction only. Percussion fire only can be used for ranging.

b. In firing salvos, an interval of five seconds between shots is recommended in order to identify the shots from each gun.

c. In order to facilitate observation the following procedure should be considered normal :

Battery : *Ready to fire.*

Observer : *Ready to observe.*

Battery : *Salvo fired.*

RULES OF OBSERVATION.

2. Bursts are usually referred to a line «Battery-Target» *B – T*, and a line perpendicular thereto passing through the target. Shots are reported as «*Right*» or «*Left*», «*Short*» or «*Over*». The *amount* of the error is ordinarily given for the first salvo only, or when the error is abnormal. In all cases, after the bracket has been obtained, only the sense of bursts is given. On account of dispersion, it is useless to attempt a closer bracket than 100 yards for range and 25 yards for deflection. Indications as to deflection are always sent before those for range. Indications as to amount of error precede those as to sense of error. Whenever evident effect is produced at the target, the report «*Target*» should be sent.

3. Whenever the observer is in a proper position to observe and a burst is not seen, «*Lost*» should be sent. If not ready to observe, the observer should send «*I was not in a position to observe*».

4. If the balloon makes an angle greater than 30° with the line Battery-Target *B – T*, the co-ordinates of the balloon position are sent to the battery for reference and the errors are reported with reference to the line Balloon-Target and replotted at the battery.

5. When telephone communication is interrupted, wireless telegraphy or projectors are used. In that case, the rules given for observation by aeroplane hold good.

SIMULTANEOUS ADJUSTMENT.

6. Under ordinary conditions a balloon observer can generally observe for two batteries. If one of them is a heavy battery firing slowly, he can observe for three. Such observation requires excellent telephone discipline which is attempted through a central group whenever the batteries pertain to a group. If the batteries do not belong to a group, communication is obtained through a central balloon company.

7. Whenever a battery has adjusted fire with the assistance of an aeroplane or balloon observer, it must immediately make a new adjustment with the same ammunition on another target visible from the ground and as near to the original target as possible. Having done this the battery, without the assistance of an aeroplane or a balloon, can open effective fire on the target in question at any time, provided atmospheric corrections are properly made. The results of such adjusting fire on an auxiliary target, as well as the results of the fire adjusted by the aerial observer, must be recorded in the Battery Data Book («Carnet de Tir»).

PART III.

RULES FOR THE CONDUCT OF FIRE OF HEAVY ARTILLERY. OBSERVATION FROM AN AEROPLANE.

1. In the adjustment of heavy artillery, there is no principle not involved in the conduct of fire of light artillery. Strict discipline is called for, and the following rules must be followed.

FOR MEDIUM CALIBRES TO INCLUDE TEE 155 MM.

2. Preparation of Fire : It is essential that the first salvo fall where the aerial observer expects it to fall. In order to accomplish this, make careful preliminary adjustment of deflection, distribution and range, using an auxiliary target and either balloon or terrestrial observation. The adjustment must be piece by piece, and the «range for the moment» must be established.

The telephone connection must be absolutely assured, and no relays can be relied upon. All means for saving time are taken advantage of.

3. Adjustment of Fire : Battery volleys of two rounds each are advisable. Non-delayed action fuses are used in order to make bursts more visible. The sheaf is parallel for the first shots, and is then modified as needed. In order to correct the individual errors of guns, the four rounds are then fired with five seconds interval. The aerial observer then reports, for example :

055 Left, 151 Short. — 202 Short. — 101 Right, 202 Short. — 151 Short.

This is continued until the end of the fire for amelioration. If less number of rounds are reported upon than have been fired, the Battery Commander takes as a general result the average of the reports received and disregards the shots not reported on for the individual adjustment. If this trouble continues, return to fire by piece, the aerial observer reporting, for example :

Lost. — Lost. — 055 Right, Correct for Range. — 101 Left, 101 Short.

4. In principle, if the battery has not fired, the aerial observer asks again for fire. If the battery cannot fire within thirty seconds after observer's request for fire, the Battery Commander waits for a new request. If fire is interrupted advise the aerial observer at once of the probable length of the delay.

If the aerial observer does not see the bursts when he is in a position to see them, do not use the same data for a second salvo, but use data half way between the last salvo seen and the one the observer could not observe. Use non-delayed action fuses to make more smoke whenever there is difficulty in observation. But if the observer was simply not in a position to see, repeat salvo with old data. In the case of modern rapid-fire heavy artillery, fire several rounds from each gun. If the wind is blowing from the left, fire from the right. If the wind is blowing from the right, fire from the left.

5. Fire for effect is divided into fire for precision for demolition and zone fire.

6. Fire for precision is carefully supervised by the aerial observer and is delivered by battery salvos at two or three seconds interval. Twenty-four rounds are usually fired, and then the aerial observer makes a report, for example, as follows :

5 Short, 12 Over, 1 Target (assuming that 18 rounds have been observed).

Eventually certain individual pieces may be distinguished and their errors reported, for example, as follows :

1st Piece, 151 Short.

To change to new target or to new part of old target, the observer sends, for example :

Change Target, Add 350 ; or *Change Target, Subtract 30.*

After firing twenty-four rounds, if the individual adjustment of the pieces is satisfactory, continuous fire may be employed; but salvos must be resumed as soon as the aerial observer asks for them. In no case should accuracy be sacrificed for speed.

7. Zone fire depends upon the bracket previously determined. Never search a zone wider than the bracket appropriate to the case.

a. *Controlled Fire :* After firing either twelve or twenty-four rounds fired by salvos, the aerial observer should report as to the mean point of impact and individual errors of pieces, if any, as follows :

055 Right, 151 Short, 1st Piece 202 Over.

The number of bursts, «short», «over», or «target» may also be announced.

b. *Progressive Fire :* This is not as effective as controlled fire. It is used only in concentrations of fire which aerial observation can not control except as to general effect.

8. One aerial observer may observe for two heavy batteries, either on the same or on different targets.

9. In such cases, if the batteries are together one officer should be designated as a fire commander for the two. If they are not together they should work separately, firing alternate salvos at the request of the aerial observer. After adjustment, each battery should fire twenty-four rounds for amelioration of fire separately. Then they should simultaneously open fire for effect.

10. When two batteries fire on different targets, the same principle applies. Fire for effect should be delivered in series, first of twenty-four rounds per battery and then in longer series.

Never sacrifice accuracy for speed. If the fire of one battery is unsatisfactory, the observer should ask for a cessation of fire and should go on with the other battery. The observer announces to one battery, for example :

Range (or *Deflection*) *not adjusted. Cease firing.*

GUNS ABOVE 155 MM.

11. In principle, the fire should be adjusted shot by shot, gun by gun, after the instructions given in Par. 18 on the Firing Instructions of May 15, 1915.

Whenever an error in amount is surely observed, the aerial observer announces it.

Correct the second round by the amount of the error reported for the first round; correct the third round by an error equal to one-half of the error reported for the second round; correct the fourth round by a correction equal to one-third the error reported for the third round, and so on until the range correction is as small as one-sixth the bracket for range and the deflection correction is as small as one-half a decigrade (8/10 of a mil.).

Follow this fire by six rounds fired for amelioration.

The same precise method should be followed with the 155 mm. gun if it is desired to destroy a small target with a minimum number of rounds. On the contrary, with good observers, battery salvos may be used even with larger guns.

RULES OF OBSERVATION.

12. In principle, a conference between the aerial observer and the Battery Commander should precede each adjustment; but, for practice, it is often advisable to do without it. In the designation of objectives, the aerial observer is the delegate of the Commanding Officier; in the conduct of fire, he is the assistant of the Battery Commander.

The aerial observer designates targets and asks for adjustment on the most important. The Artillery Commander designates the battery to fire and indicates his decision to the aerial observer by means of a panel. If it is not deemed advisable to fire on the target designated, he so advises aerial observer and asks for the designation of another target; but, in principle, to avoid confusion, it is best to accede to demands made by aerial observer when possible.

13. For heavy caliberd guns, the amount of error of each burst should be reported. The deflection error should first be given and then the range error. Errors should be estimated by reference to the map and to aerial photographs. The amount of the errors always precedes the sense of the error.

For medium calibred guns, the amount of observed errors is usually given in the case of the first salvo only. In subsequent salvos it is given only when the observed error equals or exceeds 100 meters. In principale, errors are referred to the center of the target unless other arrangements have been made with the Battery Commander.

14. The aerial observer may interfere in the conduct of fire when :

a. He thinks that circumstances necessitate fire for precision;

b. If the object has been accomplished;

c. If the target must be changed;

d. If observation becomes impossible. In such cases, the observer sends, for example :

Observation impossible. Change target. Add. 155; or

Observation impossible, Auxiliary Target.

Then, after adjustment on new or auxiliary target, it will not be difficult to shift the sheaf to the original target.

BALLOON OBSERVATION.

15. The same principles apply as for observation by balloon of light artillery fire, but the reporting of the amount of errors is far more important. For high-powered heavy artillery (A. L. G. P.), if the balloon makes an angle of more than 20° with the line Battery-Target *B – T,* refer bursts to the line Balloon-Target, reporting the exact position of the balloon to the battery, or else use two balloons on the horizontal base system.

16. In general, do not expect too much of balloon observation for artillery. Utilize balloons to commence adjustment which is to be perfected by aeroplanes or to finish observation in which aeroplanes have been interrupted.

TRENCH ARTILLERY. BALLOON OBSERVATION.

17. Bursts are referred to known squares on a squared map. Only rough indications as to the squares in which bursts are seen can be given.

18. Telephone communication is relied upon, but, if it is not available, projectors may be used. If no squared map is available, refer observed bursts to a North and South and to an East and West line.

19. When using aeroplane observers, connect the trench positions of the trench artillery to the receiving station by telephone. The trench mortars should fire in rafales of eight and the mean point should be reported on. If the telephone is out of order, use projectors, after having adopted an extremely simple code. Panoramic sketches are most valuable for the designation of targets.

PART IV.

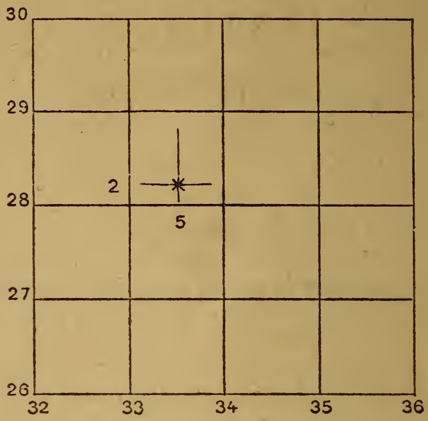
DESIGNATION OF OBJECTIVES.

1. All targets and other objectives are referred to by means of co-ordinates in the Plan Directeur de Tir (Firing Map) 1/20000 or special maps of 1/50000, with kilometric squares, with a common point of origin.

Any position can be located by giving a number of six places, giving the co-ordinates.

2. Abscissae are given first, then ordinates. The proper procedure is to start in the big squares and work inside of it.

Thus the point *x* in fig. 1



is designated as *335 – 282.* Sometimes *when working for some time on a familiar map, the first digit is omitted* and only four numbers are used to designate a point. In such a system, the point *x* referred to would be designated *35–82.*

Photographs are extremely useful for the designation of targets. In some known zones, letters may be substituted for numbers in the big squares.

ANNEX II.

USE OF SIGNALS.

PART I.

LIAISON BETWEEN AERIAL OBSERVER AND RECEIVING STATION.

Wireless Signals are divided as follows:

1° Station Calls — Groups of 2 letters.

2° Conventional Signals for adjustment of Artillery Fire and Liaison.

3° Groups of 2 numerals, for special supplementary code for adjustment of fire and for designation of important points.

4° Groups of 3 letters, for designation of targets and position of hostile or friendly troops.

5° Groups of 3 numerals, for expression of distances in meters.

6° Groups of 4 or 6 numerals, for expression of map co-ordinates.

7° Groups of 2 numerals and signals of one letter, reserved for special artillery code not otherwise covered.

8° Uncoded messages in exceptional cases.

Similar codes are used in communicating from the receiving station to the aerial observer optically, by projectors or window-shutter panels.

The Morse Code in use is as follows:

LETTERS.

a	·—
b	—···
c	—·—·
d	—··
ch	————
e	·
é	··—··
f	··—·
g	——·
h	····
i	··
j	·———
k	—·—
l	·—··
m	——
n	—·
o	———
p	·——·
q	——·—
r	·—·
s	···
t	—
u	··—
v	···—
w	·——
x	—··—
y	—·——
z	——··

NUMERALS.

1 ▪————
2 ▪▪———
3 ▪▪▪——
4 ▪▪▪▪—
5 ▪▪▪▪▪
6 —▪▪▪▪
7 ——▪▪▪
8 ———▪▪
9 ————▪
0 —————

SERVICE SIGNALS.

Ready to receive	—▪▪▪▪—▪	br
End of message	▪—▪—▪	ar
Understood	▪▪▪—▪	sn
Wait	▪—▪▪▪	as
Repeat	▪▪——▪▪	
Separation	—▪▪▪—	

1. The first letter of a Station Call is fixed in each Army by the Chief of the Radio Service of the Army. In each Army Corps, the second letter is fixed by the Chief of the Radio Service of the Army Corps.

In each artillery command various units are designated by calls, all having the same first letter, as for example: «P. A», «P. B.», «P. C.», etc.

2. The conventional code for the adjustment of fire is as follows:

Fire	———	3 long dashes.
Right	▪▪ ▪▪	2 i's.
Left	—— ——	2 m's.
Short	▪▪▪▪ ▪▪▪▪	2 h's.
Over	————	ch.
Deflection correct.	——▪▪	z.
Range correct	—▪—▪	2 n's connected.
Target	—▪▪▪	b.
Change target	—▪——▪—	2 k's connected.
Error	▪▪▪▪▪▪▪▪▪▪	10 dots.
Going to land	—▪▪▪▪▪▪—	by connected.

The signal for «Target» is sent when single shots hit the target or when a salvo or volley is observed as «bracketing». «Target, Short» is sent when, in a mixed salvo or volley, the majority of bursts are short; «Target, Over» is sent when, in a mixed salvo or volley, the majority of bursts are «over».

The following conventional code for use in liaison with infantry has been adopted:

Request Artillery Fire	——— ——— ———	Series of o's.
We are advancing. Lengthen range	▪▪▪▪ ▪▪▪▪ ▪▪▪▪ ▪▪▪▪	Series of h's.
Range too short.	▪▪▪ ▪▪▪ ▪▪▪ ▪▪▪	Series of s's.
Send ammunition.	—▪—— —▪—— —▪——	Series of y's.

3. Groups of 2 numerals for special supplementary code for adjustment of fire and for designation of localities:

1st Piece	01
2nd Piece	02
3rd Piece	03
4th Piece	04
By Piece	05
Is Battery ready?	06
Has Battery fired?	07
Can't see Projector	08
Aim on me	09
Can't see panels	11
Auxiliary Target	12
Supervising Fire	13
From the right	14
	15
	16
	17
From the left	18
How many guns fired?	19
Observation impossible	21
Very irregular for range	22
Can't observe here	23
Deflection irregular	24
Will observe as requested	25
H. E. Shell	26
Lost	27
Cease firing	28
Result accomplished	29
Friendly shots falling on	31
Continue the fire	32
Too much distribution	33
Shrapnel, time-fire	34
Zone Fire, I cease observing	35
Too much concentrated	36
By battery volleys	37
With gas shells	38
Repeat	39

Designation of important Points in each Army Zone : The numerals 41 to 94, omitting 50, 60, 70, 80 and 90 (all multiples of 10), are reserved for the designation of important points in each army zone. They are announced by Army Headquarters, beginning at the left and going toward the right of each army zone to avoid confusion with neighboring armies.

Open Numbers : The following numbers are left open for special use in each group: 15, 16, 17, 95, 96, 97, 98 and 99.

Familiar Points: In each group familiar points may be designated by single letters after agreement amongst all concerned.

4. Groups of three Letters for designation of Targets and Enemy Positions:

LIST I.

Artillery	ART
Enemy Aeroplane	AVI
Anti-aircraft Battery	BAV
Battery in action	BTA
Battery occupied	BTO
Cavalry	CAV
Convoy	COV
Direction	DIR
East from	EST
Barbed wire	FDF
Front	FRO
Infantry in column	IFC
Infantry deployed	IFD
Infantry assembled	IFR
North from	NOR
West from	OOS
Depth	PRF
Tail at	QUE
Nothing to report	RAS
South of	SUD
Friendly Troops	TAM
Trenches	TCF
Adjust on	REG
Get relief for me	RLV
I am going to relieve	VRV
Right to	DRO
Left to	GAO
Available aeroplane here	IDI
Head at	TET

LIST II.

Boyau	BYO
Grenade Fight at	CGR
Bn. Hqrs at	PBO
Brig. Hqrs. at	PBG
Div'n Hqrs at	PDI
Reg'tl Hqrs. at	PCR
Indications of hostile attack at	IAE
Can't see troops at	JPT
Friendly troops progressing at	APM
Friendly troops stopped at	AMA
Friendly troops in retreat at	ARM
Enemy troops at	TEN
Enemy troops advancing at	EPN
Heavy enemy barrage at	BRN
I cannot see shots falling at	PCT

Three additional combinations of three letters are left at the disposal of Groups of Armies.

5. Groups of three Numerals for the expression of distances : As will be noticed in the examples of messages sent in adjusting fire in Appendix I, the following rules hold good for the expression of distances:

For distances under 100 precede each distance by 0, thus:

Fifty-five	055

For distances involving even hundreds, never end with 0, thus:

One hundred	101
Two hundred	202
Three hundred	303

6. Groups of four or six Numerals are used for the location of objectives as explained in Appendix I, Part IV.

7. Groups of two Numerals and signals of one Letter are reserved for special artillery codes not otherwise provided for.

8. When uncoded Messages are used, it is necessary to use very clear language and to be very brief.

For the successful employment of Wireless Telegraphy, it is important that the following rules be observed :

a. At the beginning of each flight, the aerial observer should repeat the appropriate station call about fifteen times in order to permit the proper adjustment of the receiving set at the receiving station.

b. When this station call is heard the Receiving Officer should at once display the «Understood» panel.

c. Every message should be preceded by the station call once repeated.

d. When several numerals are sent they are separated by the signal of separation —▪▪▪—.

e. Each operator should remember that correct manipulation of the key is essential to success.

9. Dropped written Messages : Written messages are placed in the prescribed container provided with a streamer. The aerial observer should descend to an altitude of about 300 meters before dropping the message. When he is seen approaching, the head-quarters station should display the identification panel, and all batteries within 500 yards should cease firing. As soon as the message has been found, the panel signifying «Message Received» should be displayed.

PART II.

LIAISON BETWEEN THE RECEIVING STATION AND THE AERIAL OBSERVER.

Each receiving station is supplied by the Artillery Park with the following panels for communication from the ground to the aerial observer.

1. Identification Panels : Large panels, 4 meters square, tacked on wooden battens for convenient handling, white for ordinary weather, black for use in snow. Also small square of black cloth 1 meter square for use with large white panel, and small white square of same size for use with large black panel. The panels are arranged so as to indicate different artillery groups. Panels are always displayed with the long axis toward the target. A detail of one corporal and two privates is provided for their manipulation.

2. Signal Panels : White panels for ordinary use (black for use on snow) 4 meters long by 1 meter wide, arranged in various combination to agree with code.

3. Window-Shutter Panels : These panels are used for telegraphing from the earth to the aerial observer by means of the Morse code. By their use a white rectangle 1,5 meter by 2,80 meters is made to appear and disappear. Each panel is formed by seven double-faced bands of white cloth 1,5 meters by 0.40, the lower side being khaki or other neutral color. One of the larger sides is fixed, the other movable. By pulling on an operating cord the bands fold or unfold, showing alternately white or khaki. Only a movement of 20 cm. is necessary to operate it — half the width of a band.

4. Projectors : 24 cm. projectors are issued, consisting of a portable light and reflector, a belt with pockets for 8 dry cells and a manipulating button. 8 extra cells and 3 extra lamps are provided. The range is from 1,5 to 3 kilometers by daylight and 3 to 10 kilometers in the night. Projectors of 0.35, 0.60 and 0.90 cm. are also used.

In order that the Morse code may be used successfully with window-shutter panels or projectors, it is essential :

a. That the cadence be not too rapid;

b. That the dashes and dots be very distinct;

c. That dashes be exaggerated to about 3 seconds;

d. That instruments be operated calmly without hurry;

e. That the interval between letters be at least four seconds.

BLANK FORMS.

The following records are required :

Record of Daily Missions assigned to squadrons by Artillery Command.

Record of Daily Missions assigned to Balloon Company by Artillery Command.

Squadron report on Missions executed.

Observer's Detailed Report of Adjustments of Fire and Reconnaissance.

Balloon Observer's Report on Hostile Batteries seen.

Balloon Report on Adjustments of Fire.

Combined Report by Air Service, embodying information contained in the foregoing reports.

Individual Card Record of Enemy Battery Positions compiled by S. R. A. (Artillery Information Service at Corps Headquaters.)

CHART OF IDENTIFICATION PANELS.

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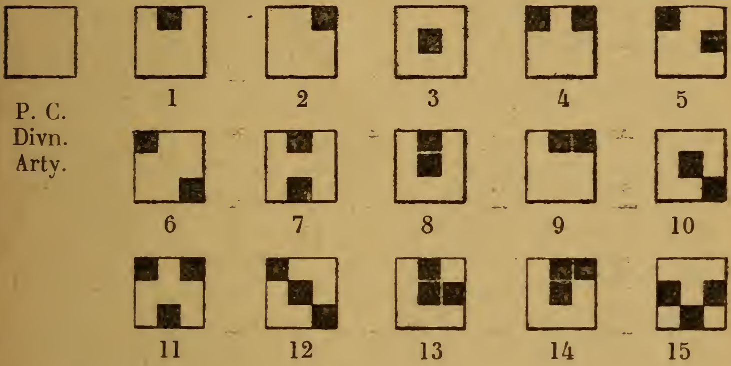
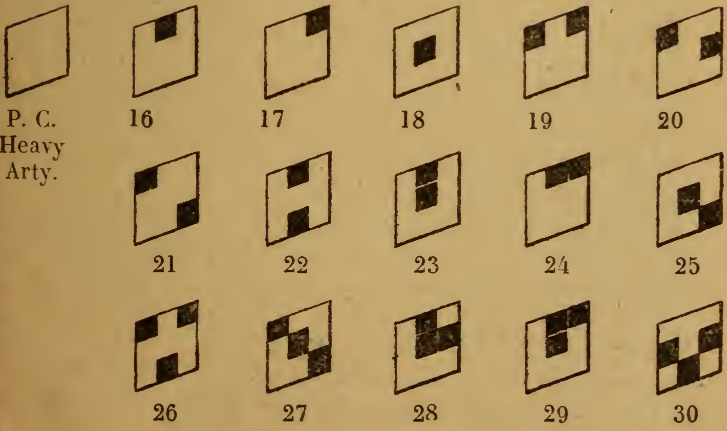
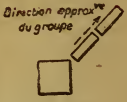
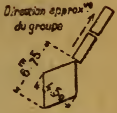
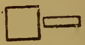
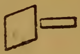
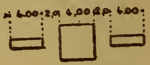
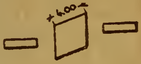
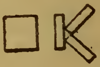
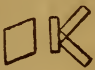
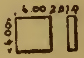
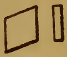
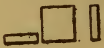
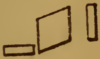
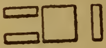
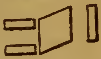
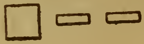
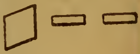
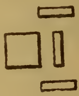
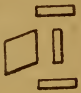
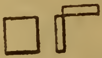
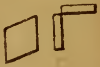
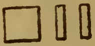
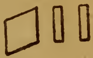
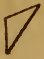
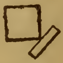
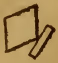
1. Panels for Commands, Sub-Commands and Groups of Divisional Artillery.

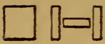
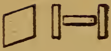
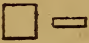
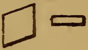
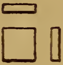
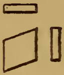
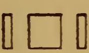
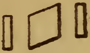
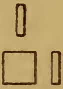
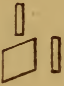
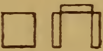
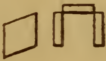
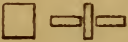
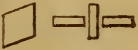
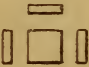
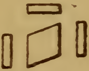
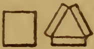
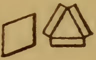
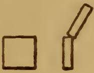
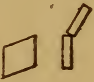
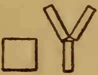
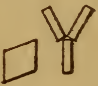
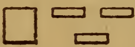
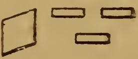


2. Panels for Commands, Sub-Commands and Groups of Heavy Artillery.

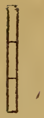


Code of Signals with panels.

		D. A.	H. A.
1	Observe fire of such and such group. Show appropriate identification Panel. (The axis of rectangular panels marks approximate direction of group.).....		
2	Request for adjustment...............		
3	Adjust on target you just indicated.....		
4	Observe fire on target N° or Shift target (followed by N° or new target)............................		
5	1st Battery ready....................		
	2d Battery ready.....................		
	3d Battery ready.....................		
6	Wait a few minutes...................		
7	Battery not ready. Delay of at least 10 minutes.........................		
8	Battery has fired.....................		
9	Your wireless works but signals confused repeat.........................		
10	Can't hear you fire not adjusted		
11	Yes. Or understood. — Or Message received............................		

		D. A.	H. A.
12	No.		
13	Continue to adjust		
14	Fire by piece		
15	Fire by salvo		
16	Amelioration		
17	Series of 24 rounds		
18	Continuous fire for effect		
19	Fire for control		
20	Enemy attacks. Be guided by previous agreement		
21	No further need of you		
22	Hostile aeroplane near you		
23			

Numerals.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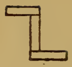
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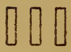
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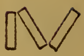
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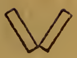
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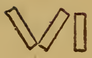
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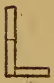
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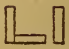
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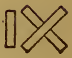
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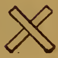
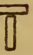

0 (zéro).

Nota. — The sigal  is reserved to indicate landing grounds.

Distance between 2 parallel panels : 2 meters.

Code for projectors and window shutter Panels.

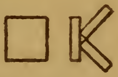
0	I want to talk	Dash held for ten seconds..............	....
3	Adjust on target you designate	—▪▪ —▪▪ —▪▪	Series of «D».
4	Observe on such or such target	—▪— —▪— —▪— —▪—	Series of «K».
5	Battery ready......	▪— ▪— ▪— ▪— ▪— ▪— ▪—	Series of «A».
6	Wait several minutes	▪—▪▪▪	Service signal.
7	Wait at least ten minutes	——▪▪ ——▪▪ ——▪▪	Series of «Z».
8	Fired............	——————————	....
9	Your wireless works but is confused...	▪▪——▪▪	Service signal.
10	Can't hear you.....	▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪▪	Series of points very fast.
	Yes...............	▪▪▪—▪	Service signal.

12	No................	—————· —————·	Series of Ch n.
13	Continue to adjust.	————·· ————··	Series of Ch i.
14	Continue to adjust piece............	———··· ———···	Series of OS.
15	Salvo.............	———· ———· ———·	Series of O.
16	melioration	—··· —··· —···	Series of B.
17	Series of 24 rounds	——···· ——···· ——····	Series of m h.
18	Fire for effect......	·———— ·————	Signal 111.
19	Fire for control....	····— ····— ····—	Signal 444.
20	Attack commences Be guided by previous arrangement	·——· ·——·	Series of p.
21	No further need of you.............	—······— —······—	Signal going to land.
22	Enemy aeroplane near you.........	··——— ··———	Signal 22.
23	....	···—— ···——	Signal 333.

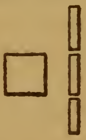
EXAMPLE OF USE OF THE SIGNAL CODE.

1. Designation of target to aerial observer.

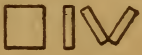
The receiving station signals :
The observer answers : «Understood»..........................



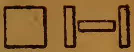
The receiving station signals :
The observer repeats : «One»..................................



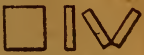
The receiving post signals :
The observer repeats : «Three»................................



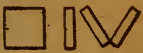
The receiving station answers «No» :
The observer answers : «Understood»........................



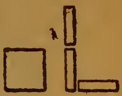
The receiving station repeats signal :
The observer repeats : «Four»..................................



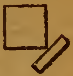
The receiving station takes off the signal at once, then repeats it :
The observer repeats : «Four».................................



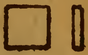
The receiving station signals :
The observer repeats : «Seven»................................



Then the observer sends :
«Ad just 1447»..
The receiving stations answers :
«Yes» ....



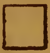
Or :
«Battery ready» ....



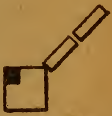
2. Commands to aerial observer.

(Case of war of movement.)

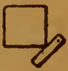
Receiving station of Division Artillery. Station call :
«X A : Here division Art. C. O. Post»...........................
An aeroplane arrives above the adjustment post and annonces :
«X A : Here observer ready to work»..........................



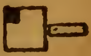
The receiving station answers :
Observe fire of group of such or such identification panel.......
To that panel corresponds for instance station call :
«X C, prearranged by the Chief of the A. C. radio service».......



The observer announces :
«X A, understood X C» ....
The receiving station answers :
«Yes» ....



The aeroplane flies away in the indicated direction and signals :
«X C, X C, I don't see panels» ....
The group whose station call is X C then show the signal :
«Here group X C ready to work»...............................



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